

**WHAT IS CLAIMED IS:**

1. A method for determining the position of a user terminal, comprising:  
receiving at the user terminal a broadcast television signal from a television signal  
transmitter;

5 determining a first pseudo-range between the user terminal and the television signal  
transmitter based on a known component of the broadcast television signal;

receiving at the user terminal a mobile telephone signal from a mobile telephone base  
station;

determining a second pseudo-range between the user terminal and the mobile

10 telephone base station based on a known component of the mobile telephone signal; and

determining a position of the user terminal based on the first and second pseudo-  
ranges, a location of the television signal transmitter, and a location of the mobile telephone  
base station;

wherein the mobile telephone signal is selected from the group consisting of

15 a EDGE (Enhanced Data Rates for Global System for Mobile  
Communications (GSM) Evolution) signal;

a Code-Division Multiple Access 2000 (cdma2000) signal; and

a Wideband Code-Division Multiple Access (WCDMA) signal.

20 2. The method of claim 1, wherein the known component of the mobile  
telephone signal is selected from the group consisting of:

a training sequence;

an unmodulated PN sequence;

a preselected spreading code in a beacon channel of the mobile telephone signal; and

25 a codeword in a synchronization channel of the mobile telephone signal.

3. The method of claim 1, wherein the broadcast television signal is selected  
from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

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4. The method of claim 1, further comprising:  
receiving at the user terminal a global positioning signal from a global positioning  
satellite;

determining a third pseudo-range between the user terminal and the global  
10 positioning satellite based on the global positioning signal; and  
determining a position of the user terminal based on the first, second and third  
pseudo-ranges, a location of the television signal transmitter, a location of the mobile  
telephone base station, and a location of the global positioning satellite.

15 5. A method for determining the position of a user terminal, comprising:  
receiving at the user terminal a broadcast television signal from a television signal  
transmitter;

determining a pseudo-range between the user terminal and the television signal  
transmitter based on a known component of the broadcast television signal;

20 receiving at the user terminal a EDGE (Enhanced Data Rates for Global System for  
Mobile Communications (GSM) Evolution) mobile telephone signal from a mobile telephone  
base station, the mobile telephone signal comprising a timing advance parameter;

determining a range between the user terminal and the mobile telephone base station  
based on the timing advance parameter; and

25 determining a position of the user terminal based on the pseudo-range, the range, a  
location of the television signal transmitter, and a location of the mobile telephone base  
station.

6. The method of claim 5, wherein the broadcast television signal is selected  
30 from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;  
a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
5 an analog television signal.

7. The method of claim 5, further comprising:  
determining a second pseudo-range between the user terminal and the mobile  
telephone base station based on a known component of the mobile telephone signal; and  
10 determining a position of the user terminal based on the first and second pseudo-  
ranges, the range, a location of the television signal transmitter, and a location of the mobile  
telephone base station.

8. The method of claim 7, further comprising:  
15 receiving at the user terminal a global positioning signal from a global positioning  
satellite;  
determining a third pseudo-range between the user terminal and the global  
positioning satellite based on the global positioning signal; and  
determining a position of the user terminal based on the first, second and third  
20 pseudo-ranges, the range, a location of the television signal transmitter, a location of the  
mobile telephone base station, and a location of the global positioning satellite.

9. The method of claim 5, further comprising:  
receiving at the user terminal a global positioning signal from a global positioning  
25 satellite;  
determining a second pseudo-range between the user terminal and the global  
positioning satellite based on the global positioning signal; and  
determining a position of the user terminal based on the first and second pseudo-  
ranges, the range, a location of the television signal transmitter, a location of the mobile  
30 telephone base station, and a location of the global positioning satellite.

10. A method for determining the position of a user terminal, comprising:  
receiving at the user terminal a broadcast television signal from a television signal  
5 transmitter;  
determining a first pseudo-range between the user terminal and the television signal  
transmitter based on a known component of the broadcast television signal;  
receiving at the user terminal a mobile telephone signal from a mobile telephone base  
station;  
10 determining a second pseudo-range between the user terminal and the mobile  
telephone base station based on a known component of the mobile telephone signal; and  
transmitting the first and second pseudoranges to a location server configured to  
determine a position of the user terminal based on the first and second pseudo-ranges, a  
location of the television signal transmitter, and a location of the mobile telephone base  
15 station;  
wherein the mobile telephone signal is selected from the group consisting of  
a EDGE (Enhanced Data Rates for Global System for Mobile  
Communications (GSM) Evolution) signal;  
a Code-Division Multiple Access 2000 (cdma2000) signal; and  
20 a Wideband Code-Division Multiple Access (WCDMA) signal.

11. The method of claim 10, wherein the known component of the mobile  
telephone signal is selected from the group consisting of:  
a training sequence;  
25 an unmodulated PN sequence;  
a preselected spreading code in a beacon channel of the mobile telephone signal; and  
a codeword in a synchronization channel of the mobile telephone signal.

12. The method of claim 10, wherein the broadcast television signal is selected  
30 from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;  
a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
5 an analog television signal.

13. The method of claim 10, further comprising:  
receiving at the user terminal a global positioning signal from a global positioning  
satellite;  
10 determining a third pseudo-range between the user terminal and the global  
positioning satellite based on the global positioning signal; and  
transmitting the first, second and third pseudoranges to a location server configured to  
determine a position of the user terminal based on the first, second and third pseudo-ranges, a  
location of the television signal transmitter, a location of the mobile telephone base station,  
15 and a location of the global positioning satellite.

14. A method for determining the position of a user terminal, comprising:  
receiving at the user terminal a broadcast television signal from a television signal  
transmitter;  
20 determining a pseudo-range between the user terminal and the television signal  
transmitter based on a known component of the broadcast television signal;  
receiving at the user terminal a EDGE (Enhanced Data Rates for Global System for  
Mobile Communications (GSM) Evolution) mobile telephone signal from a mobile telephone  
base station, the mobile telephone signal comprising a timing advance parameter;  
25 determining a range between the user terminal and the mobile telephone base station  
based on the timing advance parameter; and  
transmitting the pseudorange and the range to a location server configured to  
determine a position of the user terminal based on the pseudorange, the range, a location of  
the television signal transmitter, and a location of the mobile telephone base station.

15. The method of claim 14, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;  
a European Telecommunications Standards Institute (ETSI) Digital Video

5 Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

16. The method of claim 14, further comprising:

10 determining a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal; and  
transmitting the first and second pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, and a location of the mobile  
15 telephone base station.

17. The method of claim 16, further comprising:

receiving at the user terminal a global positioning signal from a global positioning satellite;

20 determining a third pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

transmitting the first, second and third pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first, second and third pseudo-ranges, the range, a location of the television signal transmitter, a location of the  
25 mobile telephone base station, and a location of the global positioning satellite.

18. The method of claim 14, further comprising:

receiving at the user terminal a global positioning signal from a global positioning satellite;

determining a second pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

transmitting the first and second pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

19. A method for determining the position of a user terminal, comprising:  
receiving a first pseudo-range from the user terminal, the first pseudo-range determined between the user terminal and a television signal transmitter based on a known component of a broadcast television signal transmitted by the television signal transmitter;  
receiving a second pseudo-range from the user terminal, the second pseudo-range determined between the user terminal and a mobile telephone base station based on a known component of a mobile telephone signal transmitted by the mobile telephone base station;  
and

determining a position of the user terminal based on the first and second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone base station;

wherein the mobile telephone signal is selected from the group consisting of  
a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) signal;  
a Code-Division Multiple Access 2000 (cdma2000) signal; and  
a Wideband Code-Division Multiple Access (WCDMA) signal.

20. The method of claim 19, wherein the known component of the mobile telephone signal is selected from the group consisting of:  
a training sequence;  
an unmodulated PN sequence;  
a preselected spreading code in a beacon channel of the mobile telephone signal; and  
a codeword in a synchronization channel of the mobile telephone signal.

21. The method of claim 19, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;  
5 a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

10 22. The method of claim 19, further comprising:  
receiving a third pseudo-range between the user terminal and a global positioning satellite based on a global positioning signal transmitted by the global positioning satellite;  
and

determining a position of the user terminal based on the first, second and third  
15 pseudo-ranges, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

23. A method for determining the position of a user terminal, comprising:  
receiving a pseudo-range between the user terminal and a television signal  
20 transmitter, the pseudo-range determined based on a known component of a broadcast television signal transmitted by the television signal transmitter;

receiving a range between the user terminal and a mobile telephone base station, the range determined based on a timing advance parameter in a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) mobile telephone signal  
25 transmitted by the mobile telephone base station; and

determining a position of the user terminal based on the pseudorange, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.



24. The method of claim 23, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video

5 Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and

an analog television signal.

25. The method of claim 23, further comprising:

10 receiving a second pseudo-range between the user terminal and the mobile telephone base station, the second pseudo-range determined based on a known component of the mobile telephone signal; and

determining a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, and a location of the mobile  
15 telephone base station.

26. The method of claim 25, further comprising:

receiving a third pseudo-range between the user terminal and the global positioning satellite, the third pseudo-range determined based on a global positioning signal transmitted  
20 by the global positioning satellite; and

determining a position of the user terminal based on the first, second and third pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

25 27. The method of claim 23, further comprising:

receiving a second pseudo-range between the user terminal and a global positioning satellite, the second pseudo-range determined based on a global positioning signal transmitted by the global positioning satellite; and

determining a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

5           28.     Computer-readable media embodying instructions executable by a computer to perform a method for determining the position of a user terminal, the method comprising:

              determining a first pseudo-range between the user terminal and a broadcast television signal transmitter based on a known component of a broadcast television signal received at the user terminal from the television signal transmitter;

10           determining a second pseudo-range between the user terminal and a mobile telephone base station based on a known component of a mobile telephone signal received at the user terminal from the mobile telephone base station; and

              determining a position of the user terminal based on the first and second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone  
15     base station;

              wherein the mobile telephone signal is selected from the group consisting of  
              a EDGE (Enhanced Data Rates for Global System for Mobile  
Communications (GSM) Evolution) signal;

              a Code-Division Multiple Access 2000 (cdma2000) signal; and  
20           a Wideband Code-Division Multiple Access (WCDMA) signal.

29.     The media of claim 28, wherein the known component of the mobile telephone signal is selected from the group consisting of:

              a training sequence;

25           an unmodulated PN sequence;

              a preselected spreading code in a beacon channel of the mobile telephone signal; and  
              a codeword in a synchronization channel of the mobile telephone signal.

30           30.     The media of claim 28, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;  
a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
5 an analog television signal.

31. The media of claim 28, wherein the method further comprises:  
determining a third pseudo-range between the user terminal and a global positioning  
satellite based on a global positioning signal received at the user terminal from the global  
10 positioning satellite; and  
determining a position of the user terminal based on the first, second and third  
pseudo-ranges, a location of the television signal transmitter, a location of the mobile  
telephone base station, and a location of the global positioning satellite.

32. Computer-readable media embodying instructions executable by a computer  
to perform a method for determining the position of a user terminal, the method comprising:  
determining a pseudo-range between the user terminal and a television signal  
transmitter based on a known component of a broadcast television signal received at the user  
terminal from the television signal transmitter;  
20 receiving at the user terminal a EDGE (Enhanced Data Rates for Global System for  
Mobile Communications (GSM) Evolution) mobile telephone signal from a mobile telephone  
base station, the mobile telephone signal comprising a timing advance parameter;  
determining a range between the user terminal and the mobile telephone base station  
based on the timing advance parameter; and  
25 determining a position of the user terminal based on the pseudo-range, the range, a  
location of the television signal transmitter, and a location of the mobile telephone base  
station.

33. The media of claim 32, wherein the broadcast television signal is selected  
30 from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;  
a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
5 an analog television signal.

34. The media of claim 32, wherein the method further comprises:  
determining a second pseudo-range between the user terminal and the mobile  
telephone base station based on a known component of the mobile telephone signal; and  
10 determining a position of the user terminal based on the first and second pseudo-  
ranges, the range, a location of the television signal transmitter, and a location of the mobile  
telephone base station.

35. The media of claim 34, wherein the method further comprises:  
15 determining a third pseudo-range between the user terminal and a global positioning  
satellite based on a global positioning signal received at the user terminal from the global  
positioning satellite; and  
determining a position of the user terminal based on the first, second and third  
pseudo-ranges, the range, a location of the television signal transmitter, a location of the  
20 mobile telephone base station, and a location of the global positioning satellite.

36. The media of claim 32, wherein the method further comprises:  
determining a second pseudo-range between the user terminal and a global  
positioning satellite based on a global positioning signal received at the user terminal from  
25 the global positioning satellite; and  
determining a position of the user terminal based on the first and second pseudo-  
ranges, the range, a location of the television signal transmitter, a location of the mobile  
telephone base station, and a location of the global positioning satellite.

37. Computer-readable media embodying instructions executable by a computer to perform a method for determining the position of a user terminal, the method comprising:

determining a first pseudo-range between the user terminal and a television signal transmitter based on a known component of a broadcast television signal received at the user terminal from the television signal transmitter;

determining a second pseudo-range between the user terminal and a mobile telephone base station based on a known component of a mobile telephone signal received at the user terminal from the mobile telephone base station; and

causing the user terminal to transmit the first and second pseudoranges to a location server configured to determine a position of the user terminal based on the first and second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone base station;

wherein the mobile telephone signal is selected from the group consisting of

a EDGE (Enhanced Data Rates for Global System for Mobile

Communications (GSM) Evolution) signal;

a Code-Division Multiple Access 2000 (cdma2000) signal; and

a Wideband Code-Division Multiple Access (WCDMA) signal.

38. The media of claim 37, wherein the known component of the mobile telephone signal is selected from the group consisting of:

a training sequence;

an unmodulated PN sequence;

a preselected spreading code in a beacon channel of the mobile telephone signal; and

a codeword in a synchronization channel of the mobile telephone signal.

39. The media of claim 37, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video

Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

40. The media of claim 37, wherein the method further comprises:

5 determining a third pseudo-range between the user terminal and a global positioning  
satellite based on a global positioning signal received at the user terminal from the global  
positioning satellite; and

causing the user terminal to transmit the first, second and third pseudoranges to a  
location server configured to determine a position of the user terminal based on the first,  
10 second and third pseudo-ranges, a location of the television signal transmitter, a location of  
the mobile telephone base station, and a location of the global positioning satellite.

41. Computer-readable media embodying instructions executable by a computer  
to perform a method for determining the position of a user terminal, the method comprising:

15 determining a pseudo-range between the user terminal and a television signal  
transmitter based on a known component of a broadcast television signal received at the user  
terminal from the television signal transmitter;

determining a range between the user terminal and a mobile telephone base station  
based on a timing advance parameter in a EDGE (Enhanced Data Rates for Global System  
20 for Mobile Communications (GSM) Evolution) mobile telephone signal received at the user  
terminal from the mobile telephone base station; and

causing the user terminal to transmit the pseudorange and the range to a location  
server configured to determine a position of the user terminal based on the pseudorange, the  
range, a location of the television signal transmitter, and a location of the mobile telephone  
25 base station.

42. The media of claim 41, wherein the broadcast television signal is selected  
from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

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43. The media of claim 41, wherein the method further comprises:  
determining a second pseudo-range between the user terminal and the mobile  
telephone base station based on a known component of the mobile telephone signal; and  
causing the user terminal to transmit the first and second pseudo-ranges and the range  
10 to a location server configured to determine a position of the user terminal based on the first  
and second pseudo-ranges, the range, a location of the television signal transmitter, and a  
location of the mobile telephone base station.

44. The media of claim 43, wherein the method further comprises:  
15 determining a third pseudo-range between the user terminal and a global positioning  
satellite based on a global positioning signal received at the user terminal from the global  
positioning satellite; and  
causing the user terminal to transmit the first, second and third pseudo-ranges and the  
range to a location server configured to determine a position of the user terminal based on the  
20 first, second and third pseudo-ranges, the range, a location of the television signal  
transmitter, a location of the mobile telephone base station, and a location of the global  
positioning satellite.

45. The media of claim 41, wherein the method further comprises:  
25 determining a second pseudo-range between the user terminal and a global  
positioning satellite based on a global positioning signal received at the user terminal from  
the global positioning satellite; and  
causing the user terminal to transmit the first and second pseudo-ranges and the range  
to a location server configured to determine a position of the user terminal based on the first

and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

46. Computer-readable media embodying instructions executable by a computer to perform a method for determining the position of a user terminal, the method comprising:  
5 determining a position of the user terminal based on

a first pseudo-range determined between the user terminal and a television signal transmitter based on a known component of a broadcast television signal transmitted by the television signal transmitter,

10 a second pseudo-range determined between the user terminal and a mobile telephone base station based on a known component of a mobile telephone signal transmitted by the mobile telephone base station,

a location of the television signal transmitter, and

a location of the mobile telephone base station;

15 wherein the mobile telephone signal is selected from the group consisting of

a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) signal;

a Code-Division Multiple Access 2000 (cdma2000) signal; and

a Wideband Code-Division Multiple Access (WCDMA) signal.

20 47. The media of claim 46, wherein the known component of the mobile telephone signal is selected from the group consisting of:

a training sequence;

an unmodulated PN sequence;

25 a preselected spreading code in a beacon channel of the mobile telephone signal; and

a codeword in a synchronization channel of the mobile telephone signal.

48. The media of claim 46, wherein the broadcast television signal is selected from the group comprising:

30 an American Television Standards Committee (ATSC) digital television signal;



a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

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49. The media of claim 46, wherein the method further comprises:

determining a position of the user terminal based on

the first and second pseudo-ranges,

a third pseudo-range determined between the user terminal and a global

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positioning satellite based on a global positioning signal transmitted by the global  
positioning satellite,

a location of the television signal transmitter,

a location of the mobile telephone base station, and

a location of the global positioning satellite.

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50. Computer-readable media embodying instructions executable by a computer  
to perform a method for determining the position of a user terminal, the method comprising:

determining a position of the user terminal based on

a pseudo-range determined between the user terminal and a television signal

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transmitter based on a known component of a broadcast television signal transmitted  
by the television signal transmitter,

a range determined between the user terminal and a mobile telephone base  
station based on a timing advance parameter in a EDGE (Enhanced Data Rates for  
Global System for Mobile Communications (GSM) Evolution) mobile telephone  
signal transmitted by the mobile telephone base station,

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the pseudorange,

the range,

a location of the television signal transmitter, and

a location of the mobile telephone base station.

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51. The media of claim 50, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video

5 Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and

an analog television signal.

52. The media of claim 50, wherein the method further comprises:

10 determining a position of the user terminal based on

the first pseudo-range,

a second pseudo-range determined between the user terminal and a mobile telephone base station based on a known component of a mobile telephone signal received at the user terminal from the mobile telephone base station,

15 a location of the television signal transmitter, and

a location of the mobile telephone base station.

53. The media of claim 52, wherein the method further comprises:

determining a position of the user terminal based on

20 the first and second pseudo-ranges,

a third pseudo-range determined between the user terminal and a global positioning satellite based on a global positioning signal transmitted by the global positioning satellite,

a location of the television signal transmitter,

25 a location of the mobile telephone base station, and

a location of the global positioning satellite.

54. The media of claim 50, wherein the method further comprises:

determining a position of the user terminal based on

30 the first second pseudo-range,

a second pseudo-range determined between the user terminal and a global positioning satellite based on a global positioning signal transmitted by the global positioning satellite,

a location of the television signal transmitter,

5 a location of the mobile telephone base station, and

a location of the global positioning satellite.

55. An apparatus for determining the position of a user terminal, comprising:

a receiver to receive at the user terminal a broadcast television signal from a

10 television signal transmitter;

a processor to determine a first pseudo-range between the user terminal and the television signal transmitter based on a known component of the broadcast television signal;

wherein the receiver receives at the user terminal a mobile telephone signal from a mobile telephone base station;

15 wherein the processor determines a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal; and

wherein the processor determines a position of the user terminal based on the first and second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone base station;

20 wherein the mobile telephone signal is selected from the group consisting of

a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) signal;

a Code-Division Multiple Access 2000 (cdma2000) signal; and

25 a Wideband Code-Division Multiple Access (WCDMA) signal.

56. The apparatus of claim 55, wherein the known component of the mobile telephone signal is selected from the group consisting of:

a training sequence;

30 an unmodulated PN sequence;

a preselected spreading code in a beacon channel of the mobile telephone signal; and  
a codeword in a synchronization channel of the mobile telephone signal.

57. The apparatus of claim 55, wherein the broadcast television signal is selected  
5 from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;  
a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
10 an analog television signal.

58. The apparatus of claim 55, wherein:  
the receiver receives at the user terminal a global positioning signal from a global  
positioning satellite;

15 the processor determines a third pseudo-range between the user terminal and the  
global positioning satellite based on the global positioning signal; and

the processor determines a position of the user terminal based on the first, second and  
third pseudo-ranges, a location of the television signal transmitter, a location of the mobile  
telephone base station, and a location of the global positioning satellite.

20 59. An apparatus for determining the position of a user terminal, comprising:  
a receiver to receive at the user terminal a broadcast television signal from a  
television signal transmitter;

25 a processor to determine a pseudo-range between the user terminal and the television  
signal transmitter based on a known component of the broadcast television signal;

wherein the receiver receives at the user terminal a EDGE (Enhanced Data Rates for  
Global System for Mobile Communications (GSM) Evolution) mobile telephone signal from  
a mobile telephone base station, the mobile telephone signal comprising a timing advance  
parameter;

wherein the processor determines a range between the user terminal and the mobile telephone base station based on the timing advance parameter; and

wherein the processor determines a position of the user terminal based on the pseudo-range, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

60. The apparatus of claim 59, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

61. The apparatus of claim 59, wherein:

the processor determines a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal; and

the processor determines a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

62. The apparatus of claim 61, wherein:

the receiver receives at the user terminal a global positioning signal from a global positioning satellite;

the processor determines a third pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the processor determines a position of the user terminal based on the first, second and third pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

63. The apparatus of claim 59, wherein:

the receiver receives at the user terminal a global positioning signal from a global positioning satellite;

5 the processor determines a second pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the processor determines a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

10 64. An apparatus for determining the position of a user terminal, comprising:

a receiver to receive at the user terminal a broadcast television signal from a television signal transmitter;

15 a processor to determine a first pseudo-range between the user terminal and the television signal transmitter based on a known component of the broadcast television signal;

wherein the receiver receives at the user terminal a mobile telephone signal from a mobile telephone base station;

20 wherein the processor determines a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal; and

a transmitter to transmitting the first and second pseudoranges to a location server configured to determine a position of the user terminal based on the first and second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone base station;

25 wherein the mobile telephone signal is selected from the group consisting of

a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) signal;

a Code-Division Multiple Access 2000 (cdma2000) signal; and

a Wideband Code-Division Multiple Access (WCDMA) signal.

65. The apparatus of claim 64, wherein the known component of the mobile telephone signal is selected from the group consisting of:

a training sequence;

an unmodulated PN sequence;

5 a preselected spreading code in a beacon channel of the mobile telephone signal; and

a codeword in a synchronization channel of the mobile telephone signal.

66. The apparatus of claim 64, wherein the broadcast television signal is selected from the group comprising:

10 an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and

an analog television signal.

15

67. The apparatus of claim 64, wherein:

the receiver receives at the user terminal a global positioning signal from a global positioning satellite;

the processor determines a third pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

20

the transmitter transmits the first, second and third pseudoranges to a location server configured to determine a position of the user terminal based on the first, second and third pseudo-ranges, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

25

68. An apparatus for determining the position of a user terminal, comprising:

a receiver to receive at the user terminal a broadcast television signal from a television signal transmitter;

a processor to determine a pseudo-range between the user terminal and the television signal transmitter based on a known component of the broadcast television signal;

30

wherein the receiver receives at the user terminal a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) mobile telephone signal from a mobile telephone base station, the mobile telephone signal comprising a timing advance parameter;

5            wherein the processor determines a range between the user terminal and the mobile telephone base station based on the timing advance parameter; and

            a transmitter to transmit the pseudorange and the range to a location server configured to determine a position of the user terminal based on the pseudorange, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

10            69.     The apparatus of claim 68, wherein the broadcast television signal is selected from the group comprising:

            an American Television Standards Committee (ATSC) digital television signal;

            a European Telecommunications Standards Institute (ETSI) Digital Video

15     Broadcasting - Terrestrial (DVB-T) signal;

            a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
            an analog television signal.

            70.     The apparatus of claim 68, wherein:

20            the processor determines a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal;  
            and

            the transmitter transmits the first and second pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first and  
25     second pseudo-ranges, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

            71.     The apparatus of claim 70, wherein:

            the receiver receives at the user terminal a global positioning signal from a global  
30     positioning satellite;



the processor determines a third pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the transmitter transmits the first, second and third pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first, second and third pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

72. The apparatus of claim 68, wherein:

the receiver receives at the user terminal a global positioning signal from a global positioning satellite;

the processor determines a second pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the transmitter transmits the first and second pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

73. An apparatus for determining the position of a user terminal, comprising:

a receiver to receive a first pseudo-range from the user terminal, the first pseudo-range determined between the user terminal and a television signal transmitter based on a known component of a broadcast television signal transmitted by the television signal transmitter;

wherein the receiver receives a second pseudo-range from the user terminal, the second pseudo-range determined between the user terminal and a mobile telephone base station based on a known component of a mobile telephone signal transmitted by the mobile telephone base station; and

a processor to determine a position of the user terminal based on the first and second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone base station;

wherein the mobile telephone signal is selected from the group consisting of  
a EDGE (Enhanced Data Rates for Global System for Mobile  
Communications (GSM) Evolution) signal;  
a Code-Division Multiple Access 2000 (cdma2000) signal; and  
a Wideband Code-Division Multiple Access (WCDMA) signal.

74. The apparatus of claim 73, wherein the known component of the mobile  
telephone signal is selected from the group consisting of:  
a training sequence;  
an unmodulated PN sequence;  
a preselected spreading code in a beacon channel of the mobile telephone signal; and  
a codeword in a synchronization channel of the mobile telephone signal.

75. The apparatus of claim 73, wherein the broadcast television signal is selected  
from the group comprising:  
an American Television Standards Committee (ATSC) digital television signal;  
a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

76. The apparatus of claim 73, wherein:  
the receiver receives a third pseudo-range between the user terminal and a global  
positioning satellite based on a global positioning signal transmitted by the global positioning  
satellite; and  
the processor determines a position of the user terminal based on the first, second and  
third pseudo-ranges, a location of the television signal transmitter, a location of the mobile  
telephone base station, and a location of the global positioning satellite.

77. An apparatus for determining the position of a user terminal, comprising:

a receiver to receive a pseudo-range between the user terminal and a television signal transmitter, the pseudo-range determined based on a known component of a broadcast television signal transmitted by the television signal transmitter;

wherein the receiver receives a range between the user terminal and a mobile telephone base station, the range determined based on a timing advance parameter in a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) mobile telephone signal transmitted by the mobile telephone base station; and

a processor to determine a position of the user terminal based on the pseudorange, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

78. The apparatus of claim 77, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

79. The apparatus of claim 77, wherein:

the receiver receives a second pseudo-range between the user terminal and the mobile telephone base station, the second pseudo-range determined based on a known component of the mobile telephone signal; and

the processor determines a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

80. The apparatus of claim 79, wherein:

the receiver receives a third pseudo-range between the user terminal and the global positioning satellite, the third pseudo-range determined based on a global positioning signal transmitted by the global positioning satellite; and

the processor determines a position of the user terminal based on the first, second and third pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

81. The apparatus of claim 77, wherein:

the receiver receives a second pseudo-range between the user terminal and a global positioning satellite, the second pseudo-range determined based on a global positioning signal transmitted by the global positioning satellite; and

the processor determines a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

82. An apparatus for determining the position of a user terminal, comprising:

receiver means for receiving at the user terminal a broadcast television signal from a television signal transmitter;

processor means for determining a first pseudo-range between the user terminal and the television signal transmitter based on a known component of the broadcast television signal;

wherein the receiver means receives at the user terminal a mobile telephone signal from a mobile telephone base station;

wherein the processor means determines a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal; and

wherein the processor means determines a position of the user terminal based on the first and second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone base station;

wherein the mobile telephone signal is selected from the group consisting of

a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) signal;  
a Code-Division Multiple Access 2000 (cdma2000) signal; and  
a Wideband Code-Division Multiple Access (WCDMA) signal.

5

83. The apparatus of claim 82, wherein the known component of the mobile telephone signal is selected from the group consisting of:

a training sequence;

an unmodulated PN sequence;

10

a preselected spreading code in a beacon channel of the mobile telephone signal; and

a codeword in a synchronization channel of the mobile telephone signal.

84. The apparatus of claim 82, wherein the broadcast television signal is selected from the group comprising:

15

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video

Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and

an analog television signal.

20

85. The apparatus of claim 82, wherein:

the receiver means receives at the user terminal a global positioning signal from a global positioning satellite;

25

the processor means determines a third pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the processor means determines a position of the user terminal based on the first, second and third pseudo-ranges, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

30

86. An apparatus for determining the position of a user terminal, comprising:

receiver means for receiving at the user terminal a broadcast television signal from a television signal transmitter;

processor means for determining a pseudo-range between the user terminal and the television signal transmitter based on a known component of the broadcast television signal;

5 wherein the receiver means receives at the user terminal a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) mobile telephone signal from a mobile telephone base station, the mobile telephone signal comprising a timing advance parameter;

10 wherein the processor means determines a range between the user terminal and the mobile telephone base station based on the timing advance parameter; and

wherein the processor means determines a position of the user terminal based on the pseudo-range, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

15 87. The apparatus of claim 86, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

20 a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

88. The apparatus of claim 86, wherein:

25 the processor means determines a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal; and

the processor means determines a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

89. The apparatus of claim 88, wherein:

the receiver means receives at the user terminal a global positioning signal from a global positioning satellite;

the processor means determines a third pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the processor means determines a position of the user terminal based on the first, second and third pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

90. The apparatus of claim 86, wherein:

the receiver means receives at the user terminal a global positioning signal from a global positioning satellite;

the processor means determines a second pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the processor means determines a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

91. An apparatus for determining the position of a user terminal, comprising:

receiver means for receiving at the user terminal a broadcast television signal from a television signal transmitter;

processor means for determining a first pseudo-range between the user terminal and the television signal transmitter based on a known component of the broadcast television signal;

wherein the receiver means receives at the user terminal a mobile telephone signal from a mobile telephone base station;

wherein the processor means determines a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal; and

transmitter means for transmitting the first and second pseudoranges to a location server configured to determine a position of the user terminal based on the first and second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone base station;

5            wherein the mobile telephone signal is selected from the group consisting of  
             a EDGE (Enhanced Data Rates for Global System for Mobile  
             Communications (GSM) Evolution) signal;  
             a Code-Division Multiple Access 2000 (cdma2000) signal; and  
             a Wideband Code-Division Multiple Access (WCDMA) signal.

10           92.     The apparatus of claim 91, wherein the known component of the mobile telephone signal is selected from the group consisting of:

             a training sequence;  
             an unmodulated PN sequence;  
15           a preselected spreading code in a beacon channel of the mobile telephone signal; and  
             a codeword in a synchronization channel of the mobile telephone signal.

             93.     The apparatus of claim 91, wherein the broadcast television signal is selected from the group comprising:

20           an American Television Standards Committee (ATSC) digital television signal;  
             a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
             a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
             an analog television signal.

25           94.     The apparatus of claim 91, wherein:  
             the receiver means receives at the user terminal a global positioning signal from a  
global positioning satellite;  
             the processor means determines a third pseudo-range between the user terminal and  
30           the global positioning satellite based on the global positioning signal; and



the transmitter means transmits the first, second and third pseudoranges to a location server configured to determine a position of the user terminal based on the first, second and third pseudo-ranges, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

5

95. An apparatus for determining the position of a user terminal, comprising:  
receiver means for receiving at the user terminal a broadcast television signal from a television signal transmitter;

processor means for determining a pseudo-range between the user terminal and the television signal transmitter based on a known component of the broadcast television signal;

wherein the receiver means receives at the user terminal a EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM) Evolution) mobile telephone signal from a mobile telephone base station, the mobile telephone signal comprising a timing advance parameter;

wherein the processor means determines a range between the user terminal and the mobile telephone base station based on the timing advance parameter; and

transmitter means for transmitting the pseudorange and the range to a location server configured to determine a position of the user terminal based on the pseudorange, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

20

96. The apparatus of claim 95, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and  
an analog television signal.

97. The apparatus of claim 95, wherein:

30

the processor means determines a second pseudo-range between the user terminal and the mobile telephone base station based on a known component of the mobile telephone signal; and

the transmitter means transmits the first and second pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

98. The apparatus of claim 97, wherein:

the receiver means receives at the user terminal a global positioning signal from a global positioning satellite;

the processor means determines a third pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the transmitter means transmits the first, second and third pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first, second and third pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

99. The apparatus of claim 95, wherein:

the receiver means receives at the user terminal a global positioning signal from a global positioning satellite;

the processor means determines a second pseudo-range between the user terminal and the global positioning satellite based on the global positioning signal; and

the transmitter means transmits the first and second pseudo-ranges and the range to a location server configured to determine a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

100. An apparatus for determining the position of a user terminal, comprising:

receiver means for receiving a first pseudo-range from the user terminal, the first pseudo-range determined between the user terminal and a television signal transmitter based on a known component of a broadcast television signal transmitted by the television signal transmitter;

5 wherein the receiver means receives a second pseudo-range from the user terminal, the second pseudo-range determined between the user terminal and a mobile telephone base station based on a known component of a mobile telephone signal transmitted by the mobile telephone base station; and

processor means for determining a position of the user terminal based on the first and  
10 second pseudo-ranges, a location of the television signal transmitter, and a location of the mobile telephone base station;

wherein the mobile telephone signal is selected from the group consisting of  
a EDGE (Enhanced Data Rates for Global System for Mobile  
Communications (GSM) Evolution) signal;

15 a Code-Division Multiple Access 2000 (cdma2000) signal; and  
a Wideband Code-Division Multiple Access (WCDMA) signal.

101. The apparatus of claim 100, wherein the known component of the mobile telephone signal is selected from the group consisting of:

20 a training sequence;  
an unmodulated PN sequence;  
a preselected spreading code in a beacon channel of the mobile telephone signal; and  
a codeword in a synchronization channel of the mobile telephone signal.

25 102. The apparatus of claim 100, wherein the broadcast television signal is selected from the group comprising:

an American Television Standards Committee (ATSC) digital television signal;  
a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;  
30 a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and

an analog television signal.

103. The apparatus of claim 100, wherein:

the receiver means receives a third pseudo-range between the user terminal and a  
5 global positioning satellite based on a global positioning signal transmitted by the global  
positioning satellite; and

the processor means determines a position of the user terminal based on the first,  
second and third pseudo-ranges, a location of the television signal transmitter, a location of  
the mobile telephone base station, and a location of the global positioning satellite.

104. An apparatus for determining the position of a user terminal, comprising:

receiver means for receiving a pseudo-range between the user terminal and a  
television signal transmitter, the pseudo-range determined based on a known component of a  
broadcast television signal transmitted by the television signal transmitter;

15 wherein the receiver means receives a range between the user terminal and a mobile  
telephone base station, the range determined based on a timing advance parameter in a  
EDGE (Enhanced Data Rates for Global System for Mobile Communications (GSM)  
Evolution) mobile telephone signal transmitted by the mobile telephone base station; and

processor means for determining a position of the user terminal based on the  
20 pseudorange, the range, a location of the television signal transmitter, and a location of the  
mobile telephone base station.

105. The apparatus of claim 104, wherein the broadcast television signal is selected  
from the group comprising:

25 an American Television Standards Committee (ATSC) digital television signal;

a European Telecommunications Standards Institute (ETSI) Digital Video  
Broadcasting - Terrestrial (DVB-T) signal;

a Japanese Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) signal; and

an analog television signal.

106. The apparatus of claim 104, wherein:

the receiver means receives a second pseudo-range between the user terminal and the mobile telephone base station, the second pseudo-range determined based on a known component of the mobile telephone signal; and

5 the processor means determines a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, and a location of the mobile telephone base station.

107. The apparatus of claim 106, wherein:

10 the receiver means receives a third pseudo-range between the user terminal and the global positioning satellite, the third pseudo-range determined based on a global positioning signal transmitted by the global positioning satellite; and

the processor means determines a position of the user terminal based on the first, second and third pseudo-ranges, the range, a location of the television signal transmitter, a  
15 location of the mobile telephone base station, and a location of the global positioning satellite.

108. The apparatus of claim 104, wherein:

the receiver means receives a second pseudo-range between the user terminal and a  
20 global positioning satellite, the second pseudo-range determined based on a global positioning signal transmitted by the global positioning satellite; and

the processor means determines a position of the user terminal based on the first and second pseudo-ranges, the range, a location of the television signal transmitter, a location of the mobile telephone base station, and a location of the global positioning satellite.

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